

CLAIMS

What is claimed is:

1. A method for improving predictive modeling of an information system, comprising:
 - 5 providing a description of a business solution comprising business components and interactions among the business components; and
 - 10 generating a predictive model of the information system comprising a business layer generated from the business solution description, the business layer modeling dynamic characteristics and behavior of the business components and the interactions among the business components in response to dynamic business workloads, such that a dynamic representation of the business solution results.
2. The method of claim 1, further comprising:
 - 15 generating an application layer and a system layer of the predictive model, the application and system layers expressing dynamic characteristics and behavior of corresponding application and system components that support the business components and the interactions among them; and
 - 20 calculating performance metrics from the predictive model for each layer, the performance metrics of the business layer indicating whether the business solution satisfies a set of business requirements regardless of whether the performance metrics of the application and system layers are acceptable.

3. The method of claim 2, wherein calculating performance metrics of the business layer is a function of the modeled dynamic characteristics and behavior.
4. The method of claim 1, wherein business components comprise business processes or sub-processes, business functions or sub-functions, and data stores.
- 5 5. The method of claim 1, wherein the dynamic characteristics and behavior of an interaction between business components comprise one or more probabilities of delays.
6. The method of claim 5, wherein a delay is associated with a conflict, contention, or lock.
- 10 7. The method of claim 5, wherein a delay is associated with processing external to a business component.
8. The method of claim 1, wherein the dynamic characteristics and behavior of an interaction between business components comprise one or more probabilities of business workload type being processed.
- 15 9. The method of claim 1, wherein the dynamic characteristics and behavior of an interaction between business components comprise one or more probabilities of an occurrence of one or more business events.
10. The method of claim 1, wherein the interaction is a merger of business workload into a business component, the dynamic characteristics and behavior of the merger comprising a probability of a delay associated with the merger.

11. The method of claim 1, wherein the interaction is an extraction of business content from a business component, the dynamic characteristics and behavior of the extraction comprising a probability of a delay associated with the extraction.
- 5 12. The method of claim 1, wherein the dynamic characteristics and behavior of a business component differs in response to business workload type or business event.
13. The method of claim 1, wherein an execution sequence of business components differs in response to business workload type or business event.
- 10 14. The method of claim 13, wherein the execution sequence of business components is affected by time constraints associated with a business event.
15. The method of claim 13, wherein the execution sequence of business components is dependent on locks.
- 15 16. The method of claim 1, wherein the business layer models dynamic characteristics and behavior of business processes having different modes of operation, the modes of operation comprising batch processing, transactional processing, messaging, or query-based processing.
- 20 17. The method of claim 1, wherein the business layer models the distribution of processes, vertically into information system model including application layer, system layer, and data stores or horizontally into sub-processes, sub-functions, and interactions.

18. A method for improving the accuracy of a predictive model of an information system, comprising:
- generating a predictive model of an information system comprising a business layer, an application layer, and a system layer, each layer modeling dynamic characteristics and behavior of one or more components;
- calculating individual performance metrics for each component modeled in the application and system layers from the dynamic characteristics and behavior;
- comparing the calculated individual performance metrics against predefined individual performance benchmarks to assess the accuracy of the predictive model; and
- performing a sensitivity analysis on individual component models that do not substantially match a corresponding performance benchmark.
19. The method of claim 18, wherein performing a sensitivity analysis further comprises:
- adjusting one or more parameters of an equation expressing the component model;
- further calculating individual performance metrics for each component model in the application and system layers; and
- comparing the individual performance metrics against individual performance benchmarks to assess the accuracy of the predictive model.
20. The method of claim 19, repeats until all of the individual performance metrics are within a predefined threshold of the individual performance benchmarks.

21. The method of claim 18, further comprising:
calculating individual performance metrics for each component
model in the application and system layers for a variety of workloads;
constructing prototypes of at least a portion of the information
5 system;
obtaining actual performance metrics from the prototype for the
variety of workloads;
comparing the actual performance metrics obtained from the
prototypes against the calculated individual performance metrics for the
10 variety of workloads to assess stability of the prototype.
22. The method of claim 21, further comprising:
modifying one or more prototypes that do not substantially match
the corresponding individual performance metrics;
further obtaining of actual performance metrics from the
15 reconstructed prototypes for the variety of workloads; and
comparing the actual performance metrics against individual
performance metrics to assess the stability of the reconstructed
prototypes.
23. The method of claim 22, repeats until all of the actual performance metrics are
20 within a certain accuracy of the individual performance metrics.
24. A system for improving predictive modeling of an information system,
comprising:
an input module providing a description of a business solution to
a construction module, the description of the business solution
25 comprising business components and interactions among the business
components; and

the construction module generating a predictive model of the information system comprising a business layer generated from the business solution description, the business layer modeling dynamic characteristics and behavior of the business components and the interactions among the business components in response to dynamic business workloads, such that a dynamic representation of the business solution results.

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25. The system of claim 24, further comprising:

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the construction module generating an application layer and a system layer of the predictive model, the application and system layers expressing dynamic characteristics and behavior of corresponding application and system components that support the business components and the interactions among them; and

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a performance metric calculation module calculating performance metrics from the predictive model for each layer, the performance metrics of the business layer indicating whether the business solution satisfies a set of business requirements regardless of whether the performance metrics of the application and system layers are acceptable.

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26. The system of claim 25, wherein the performance metric calculation module calculates performance metrics of the business layer as a function of the modeled dynamic characteristics and behavior.

27. The system of claim 24, wherein business components comprise business processes or sub-processes, business functions or sub-functions, and data stores.

28. The system of claim 24, wherein the dynamic characteristics and behavior of an interaction between business components comprise one or more probabilities of delays.
29. The system of claim 28, wherein a delay is associated with a conflict, contention,
5 or lock.
30. The system of claim 28, wherein a delay is associated with processing external to a business component.
31. The system of claim 24, wherein the dynamic characteristics and behavior of an
10 interaction between business components comprise one or more probabilities of business workload type being processed.
32. The system of claim 24, wherein the dynamic characteristics and behavior of an interaction between business components comprise one or more probabilities of an occurrence of one or more business events.
33. The system of claim 24, wherein the interaction is a merger of business
15 workload into a business component, the dynamic characteristics and behavior of the merger comprising a probability of a delay associated with the merger.
34. The system of claim 24, wherein the interaction is an extraction of business content from a business component, the dynamic characteristics and behavior of the extraction comprising a probability of a delay associated with the extraction.
- 20 35. The system of claim 24, wherein the dynamic characteristics and behavior of a business component differs in response to business workload type or business event.

36. The system of claim 24, wherein an execution sequence of business components differs in response to business workload type or business event.
37. The system of claim 36, wherein the execution sequence of business components is affected by time constraints associated with a business event.
- 5 38. The system of claim 36, wherein the execution sequence of business components is dependent on locks.
39. The system of claim 24, wherein the business layer models dynamic characteristics and behavior of business processes having different modes of operation, the modes of operation comprising batch processing, transactional
10 processing, messaging, or query-based processing.
40. The system of claim 24, wherein the business layer models the distribution of processes, vertically into information system model including application layer, system layer, and data stores or horizontally into sub-processes, sub-functions, and interactions.
- 15 41. A system for improving the accuracy of a predictive model of an information system, comprising:
a construction module generating a predictive model of an information system comprising a business layer, an application layer, and a system layer, each layer modeling dynamic characteristics and behavior
20 of one or more components;
a performance metric calculation module calculating individual performance metrics for each component modeled in the application and system layers from the dynamic characteristics and behavior;

the construction module comparing the calculated individual performance metrics against predefined individual performance benchmarks to assess the accuracy of the predictive model; and

5 the construction module performing a sensitivity analysis on individual component models that do not substantially match a corresponding performance benchmark.

42. The system of claim 41, wherein the construction module performing a sensitivity analysis further comprises:

10 the construction module adjusting one or more parameters of an equation expressing the component model;

the performance metric calculation module further calculating individual performance metrics for each component model in the application and system layers; and

15 the construction module comparing the individual performance metrics against individual performance benchmarks to assess the accuracy of the predictive model.

43. The system of claim 42, repeats until all of the individual performance metrics are within a predefined threshold of the individual performance benchmarks.

44. A system of claim 41, further comprising:

20 the performance metric calculation module calculating individual performance metrics for each component model in the application and system layers for a variety of workloads;

prototypes being constructed of at least a portion of the information system;

25 actual performance metrics being obtained from the prototype for the variety of workloads;

the actual performance metrics being compared against the
calculated individual performance metrics for the variety of workloads to
assess stability of the prototype.

45. The system of claim 44, further comprising:
- 5 one or more prototypes that do not substantially match the
corresponding individual performance metrics being modified;
 actual performance metrics being further obtained from the
reconstructed prototypes for the variety of workloads; and
 the actual performance metrics being compared against individual
10 performance metrics to assess the stability of the reconstructed
prototypes.
46. The system of claim 45, repeats until all of the actual performance metrics are
within a certain accuracy of the individual performance metrics.